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U. S. PATENT OFFICE
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See
Pat. #2247517
(mold)

25/12 A

A PICTURE STORY OF A

CULVERT

With a Good Ending

U. S. Patent Office
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FEB 1 1941
DIVISION 15

Mold
Pat. # 2247517 25/124
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SPECIAL END SECTIONS

FOR CONCRETE PIPE CULVERTS

as manufactured by

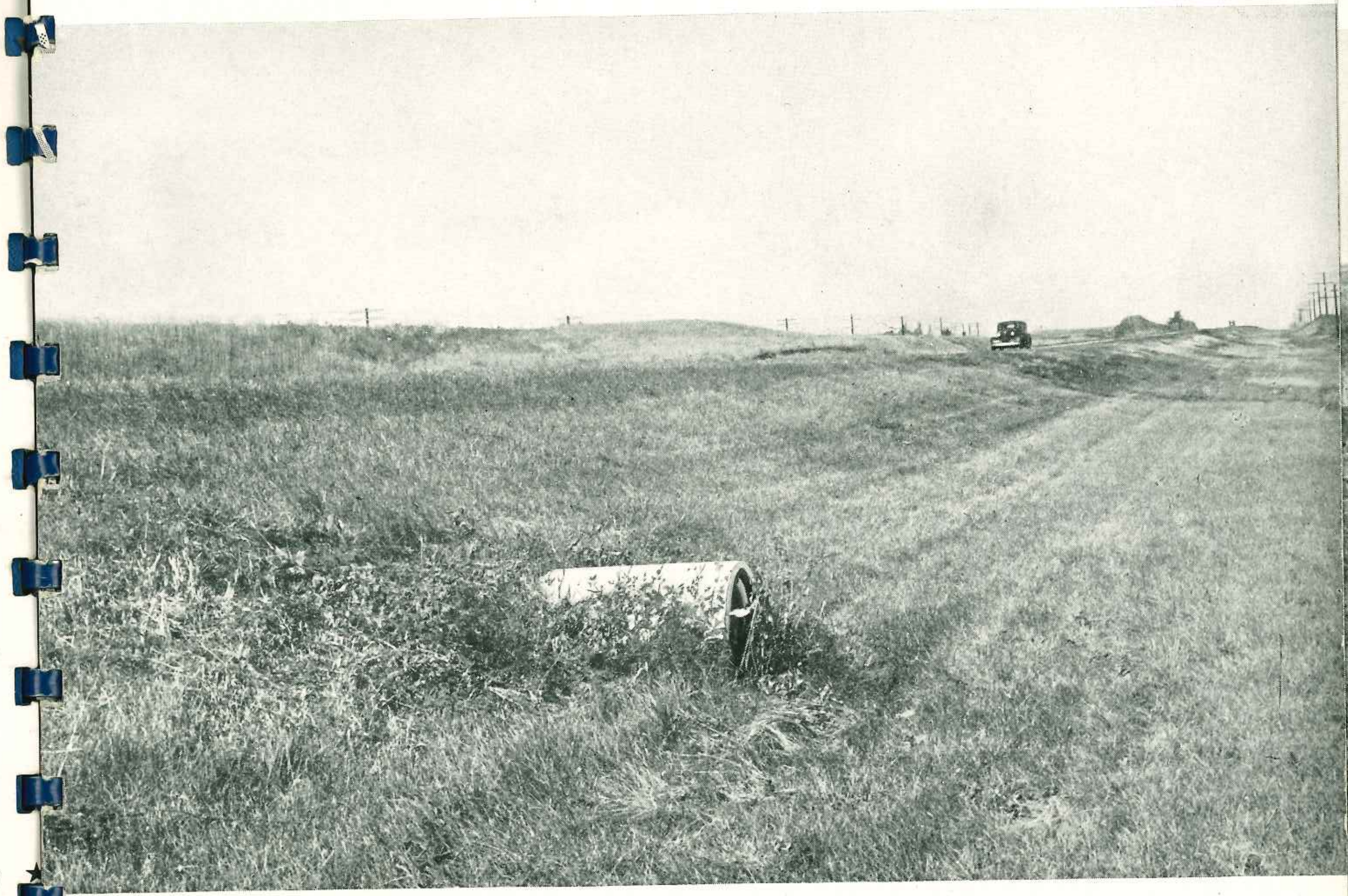
The Cretex Companies

FACTORIES AT . . . ELK RIVER, MINNESOTA
CROOKSTON, MINNESOTA
AUSTIN, MINNESOTA
FERGUS FALLS, MINNESOTA
NEW ULM, MINNESOTA

DISTRIBUTED BY THE
ELK RIVER CONCRETE PRODUCTS CO.
752 BUILDERS EXCHANGE · MINNEAPOLIS, MINN.

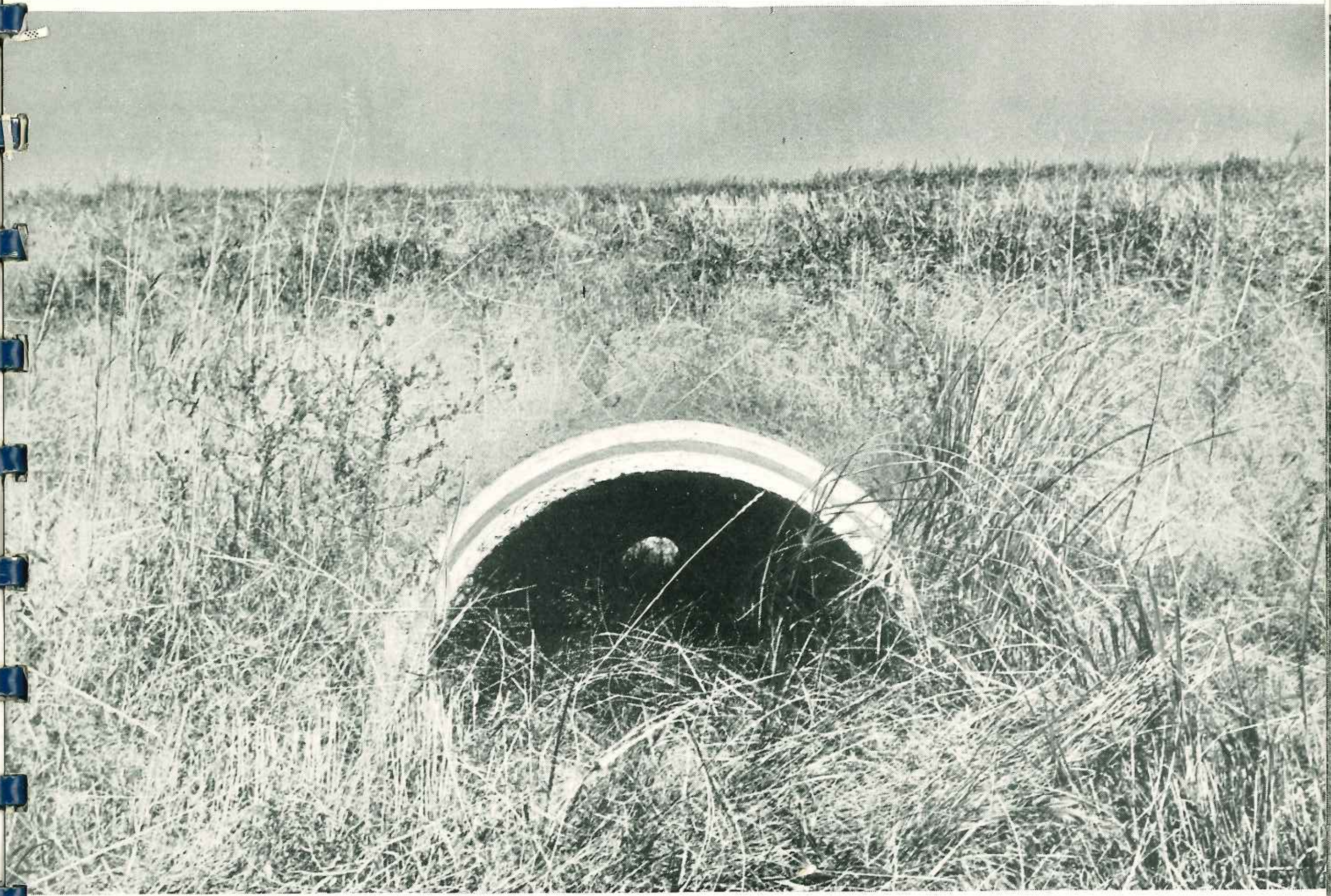
Mr. Merchant – Atty.

FLAT EMBANKMENT SLOPES NOW USED IN MODERN HIGHWAYS CALL FOR SOME SPECIAL TREATMENT OF THE ENDS OF CULVERTS.



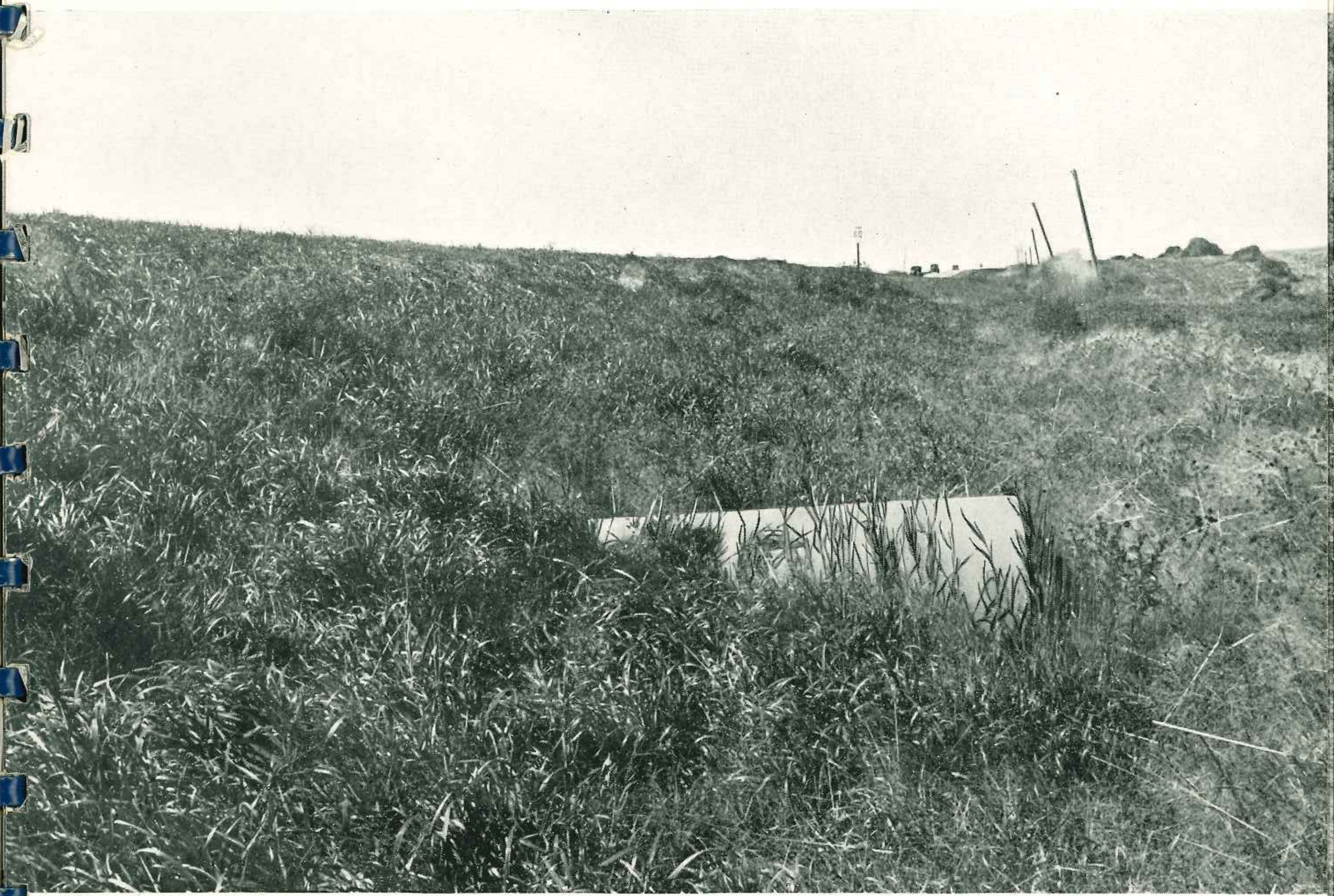
The projecting ends of pipe culverts do not harmonize with the smooth streamlike appearance of roadways.

WEEDS AND GRASS AROUND THE ENDS OF CULVERTS RESTRICT THEIR CAPACITY AND SOMETIMES CAUSE THEM TO CLOG.



The mowing around the end of this culvert must be done by hand.

MOWING MACHINES CAN NOT OPERATE CONTINUOUSLY OVER THE ENDS OF PROJECTING PIPE CULVERTS.

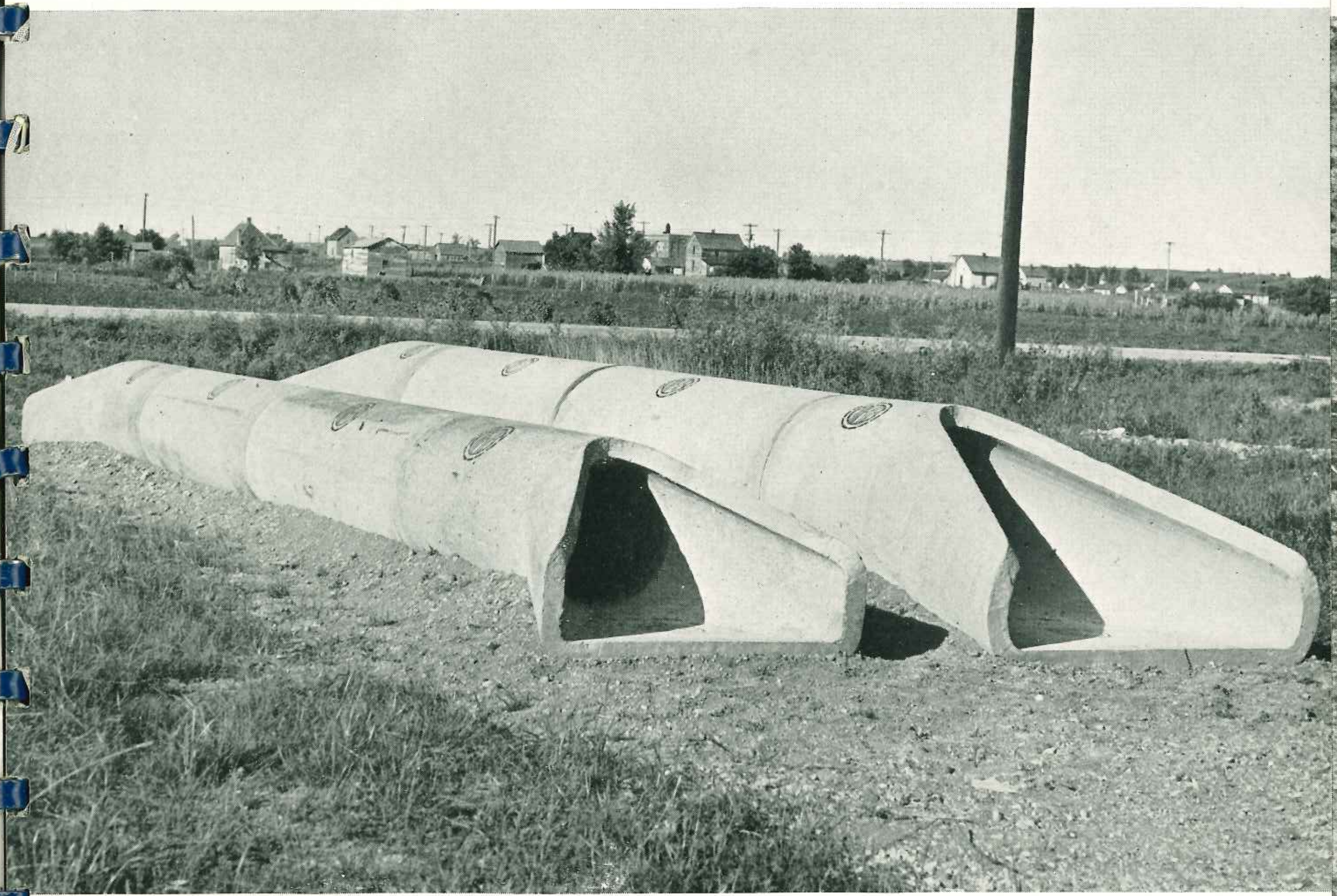


Weeds and grass around this culvert will be cut by hand.

A NEW AND BETTER WAY TO END A PIPE CULVERT.

This culvert terminal combines in one monolithic unit —

A circular section of concrete pipe
An apron for a spillway
and sloping wingwalls



Typical 18 inch and 24 inch concrete pipe culverts
with Cretex Special End Sections

THE WIDE APRON-LIKE END OF THIS CULVERT HAS MANY ADVANTAGES —

REDUCES EROSION AT THE OUTLET

by spreading the water into a relatively wide and thin sheet reducing its velocity and thus reducing erosion.

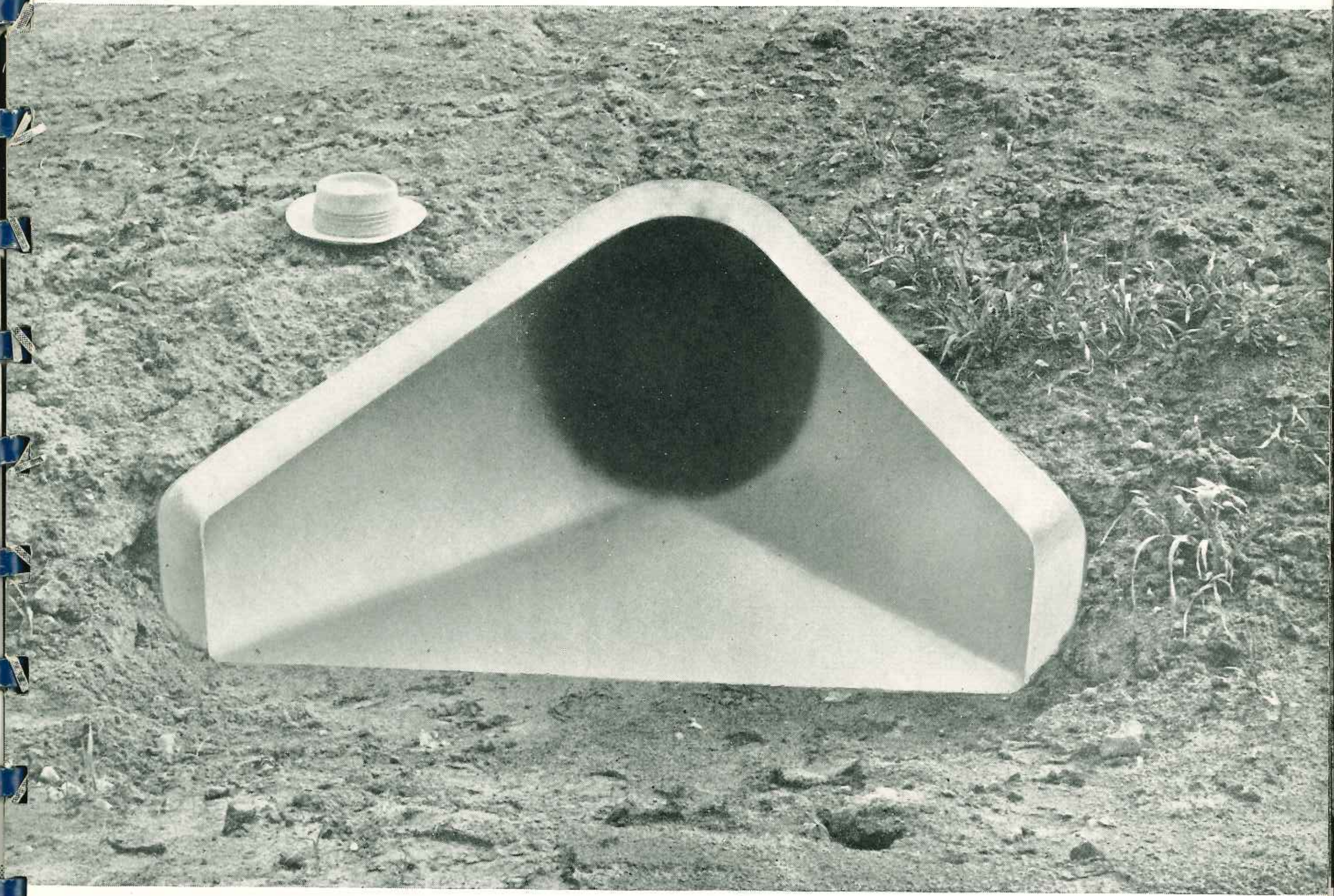
INCREASES THE CARRYING CAPACITY

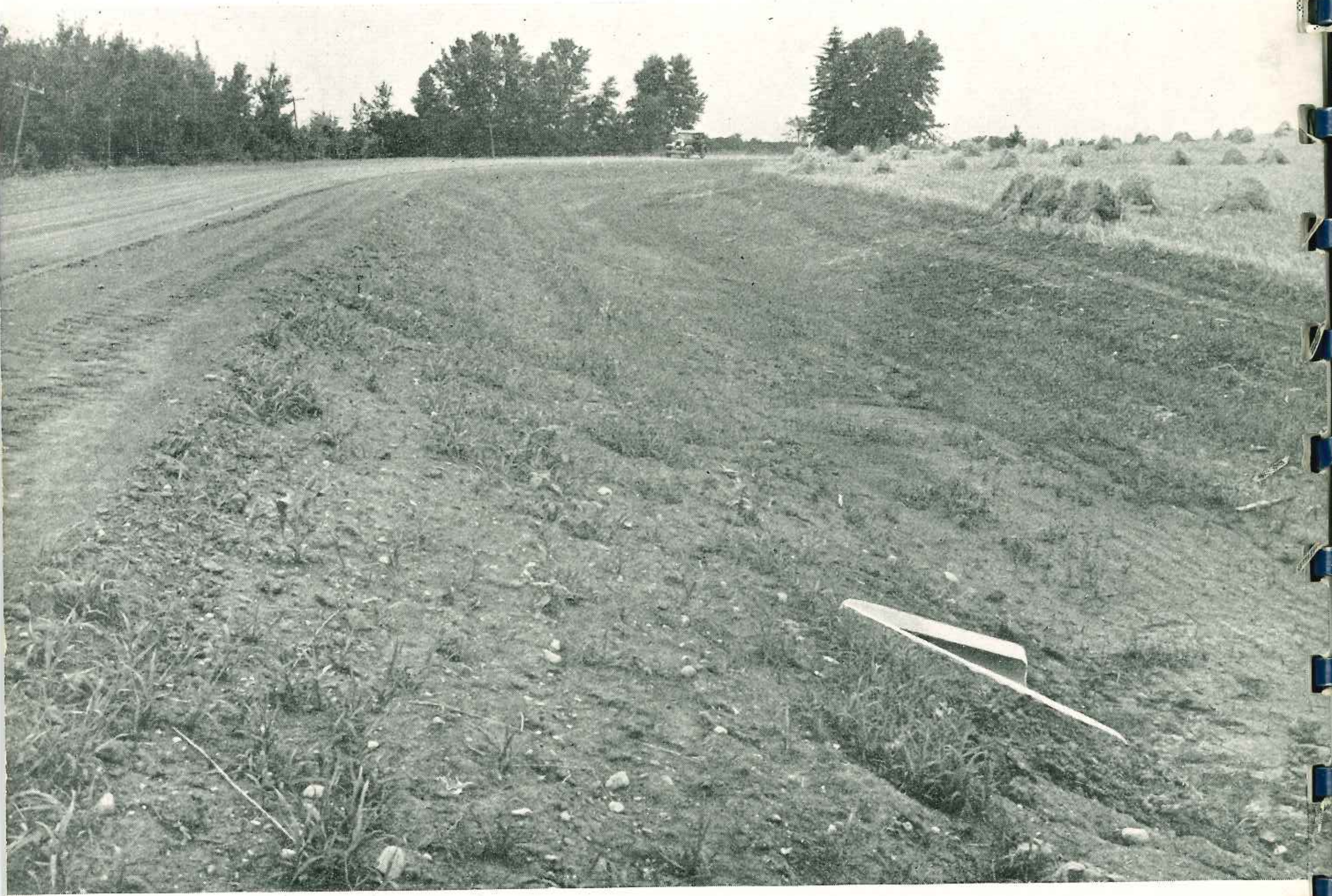
by reducing the entrance loss at the inlet end of the culvert. The entrance of the circular part is smooth and slightly rounding with no projections or sharp corners to create turbulence.

INCREASES STABILITY

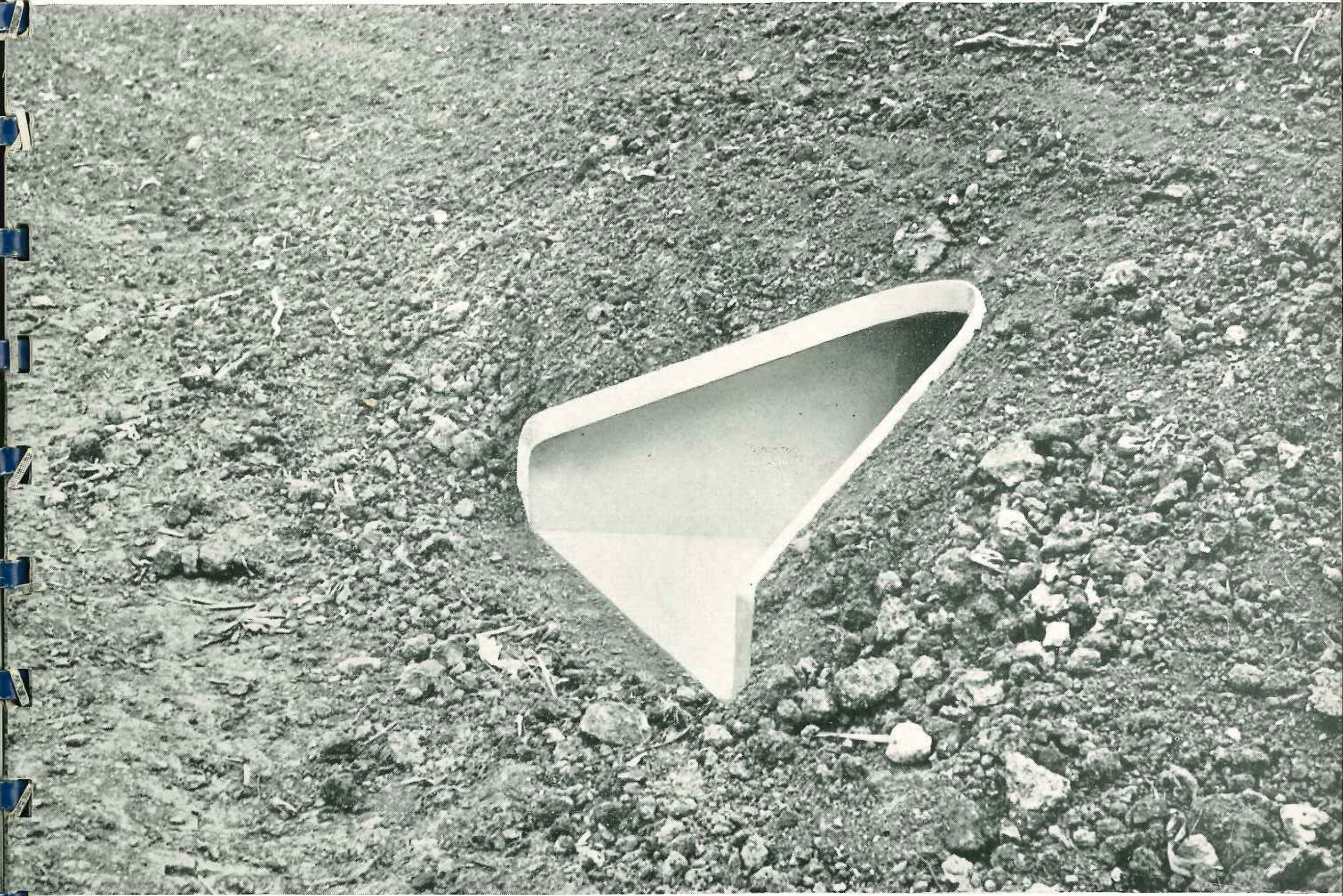
The wide flat bottom of the apron gives a greater bearing surface which tends to prevent tipping or displacement.

KEEPS THE CULVERT OPENING FREE FROM GRASS AND WEEDS



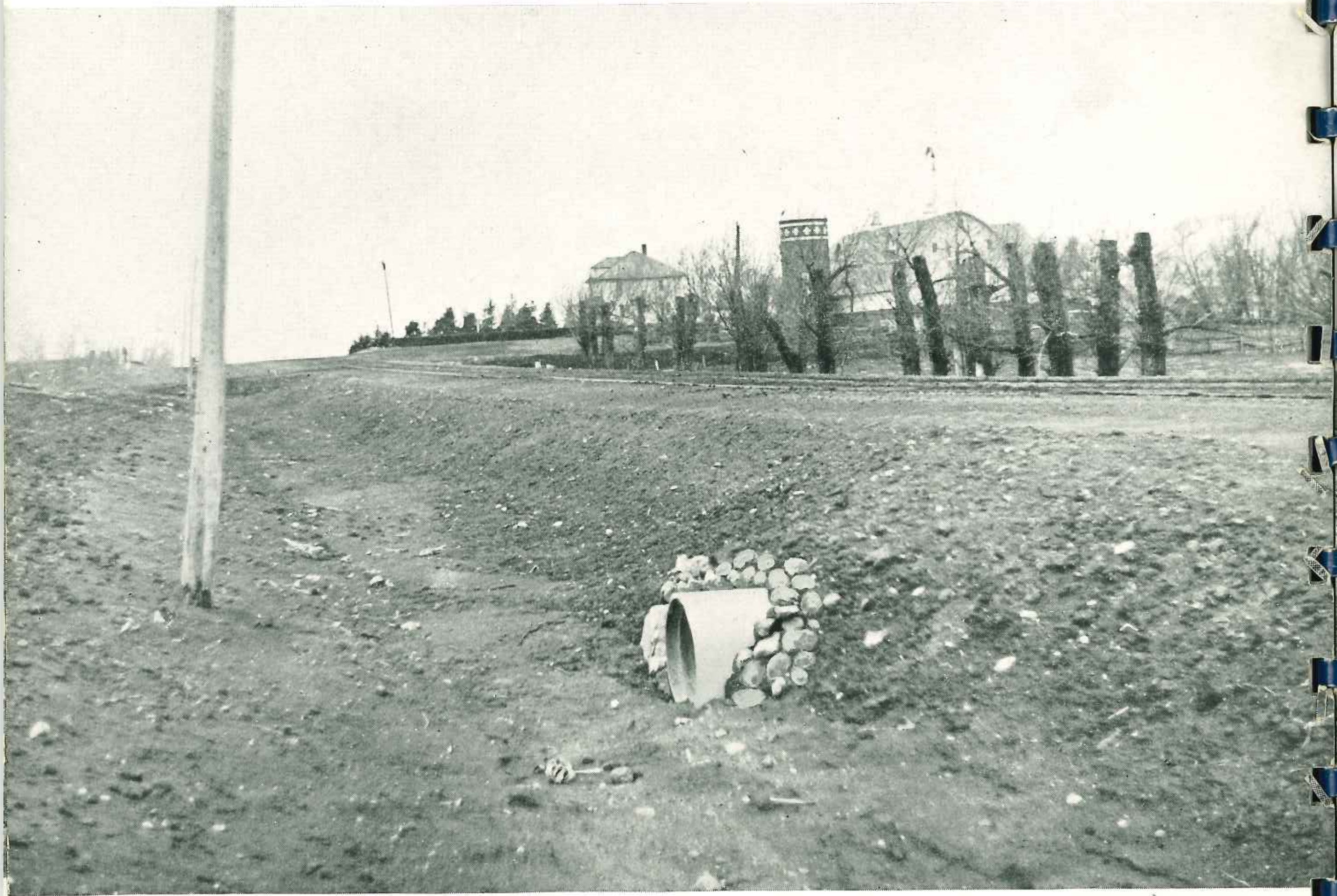


"CRETEX" END SECTIONS COINCIDE WITH THE SLOPE OF THE EMBANKMENT OVER IT THUS MAINTAINING A SMOOTH UNBROKEN APPEARANCE.



"CRETEX" END SECTIONS
NO PROJECTING ENDS
NO HINDERANCE TO MOWING BY MACHINES

BEFORE

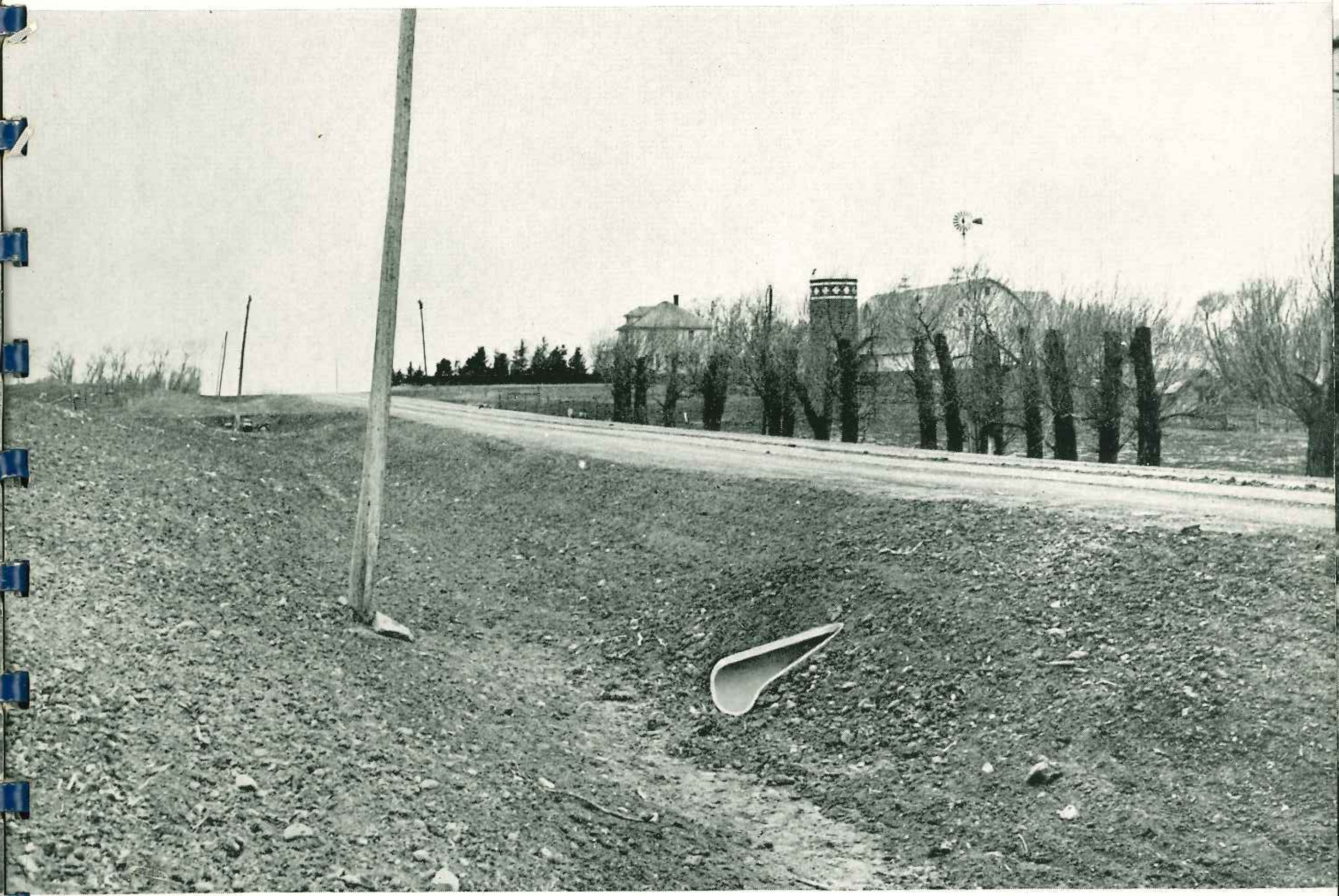


This picture shows the projecting end of the ordinary pipe culvert.

The slope of the embankment has been warped and extended outward so as to cover the end pipe as much as possible.

Loose rip rap was placed over the end to retain the embankment, to prevent wash and the growth of weeds.

AFTER



The end section of pipe shown on the opposite page was removed and replaced with a "Cretex" special end section.

Note the improvements —

Uniform slope — no projecting end
No unsightly rip rap — easier to maintain
Good clear opening

DANGEROUS . . .

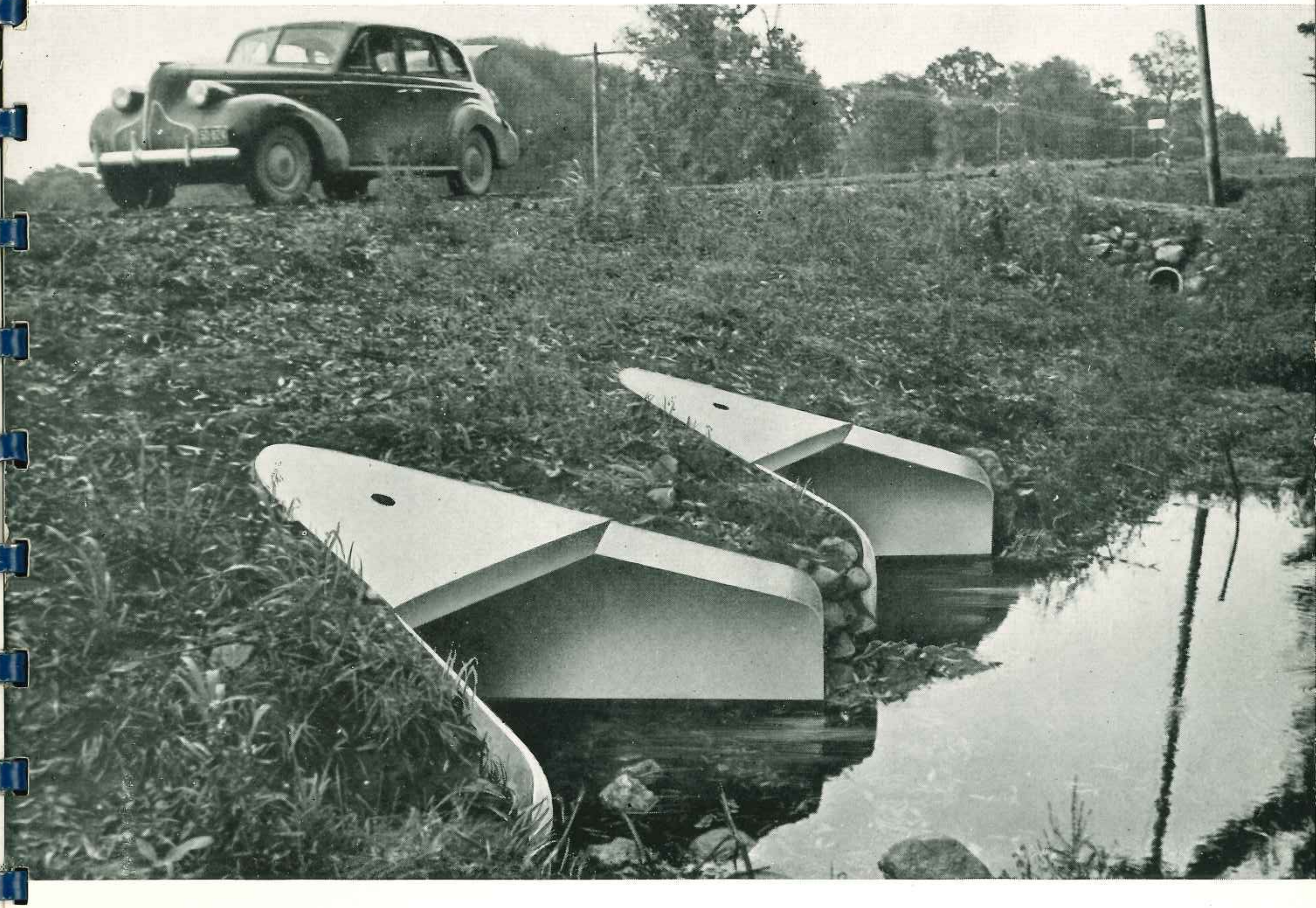
THE SIDE SLOPES OF EMBANKMENTS ARE NOW MADE AS FLAT AS POSSIBLE AND BECAUSE OF THIS THE PROJECTING ENDS OF CULVERTS OR CULVERT HEADWALLS ARE DANGEROUS TO TRAFFIC THAT MAY BE FORCED OFF THE ROADWAY.

SAFE . . .

"CRETEX" END SECTIONS WITH COVERS WILL REDUCE THIS HAZARD.

THE GREATER PART OF THE OPENING IS COVERED AND SAFE FOR TRAVEL.

THE COVER ALSO KEEPS DIRT OR SNOW FROM FILLING IN THE CIRCULAR CULVERT OPENING.

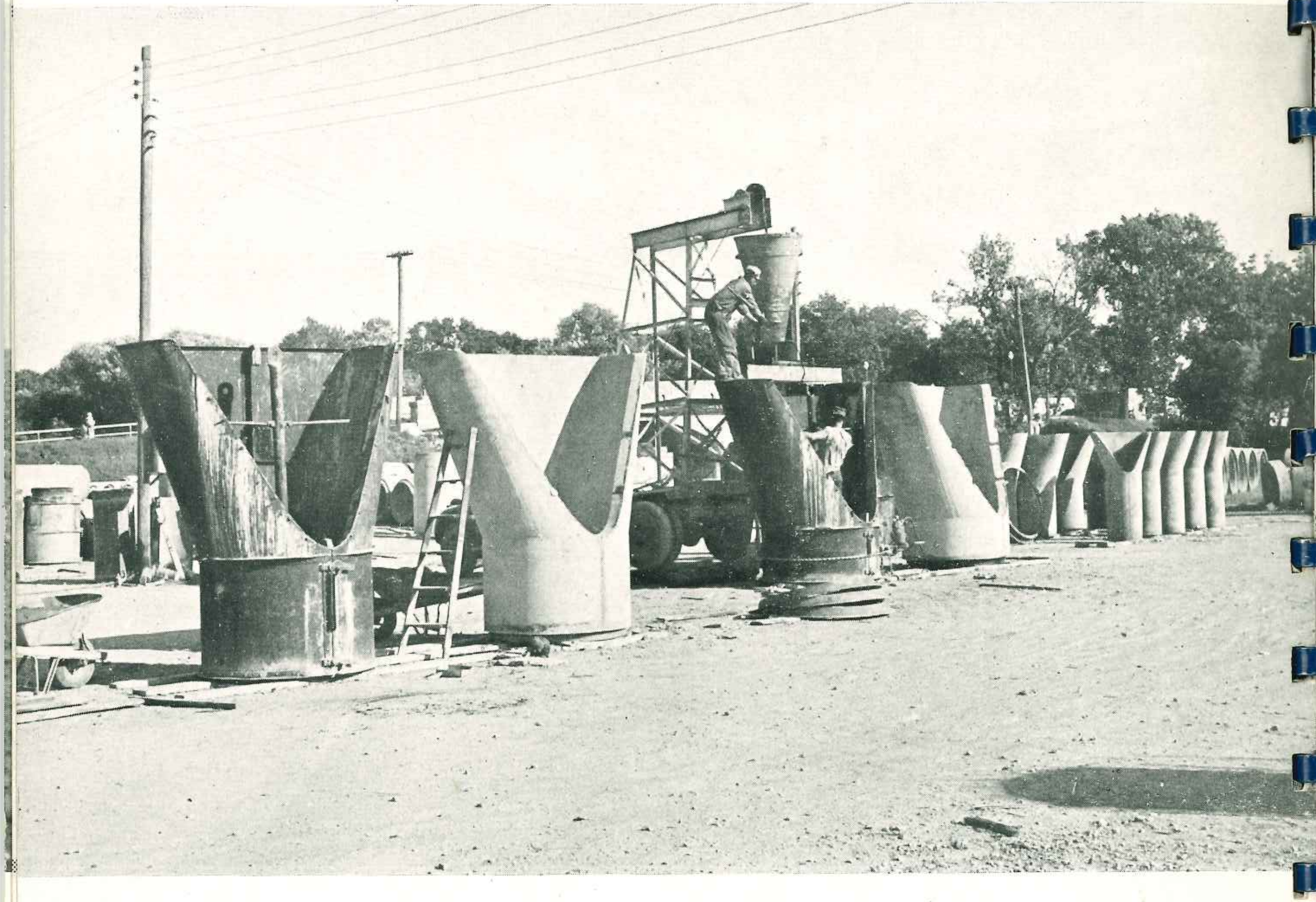


"CRETEX" END SECTIONS FOR CONCRETE PIPE CULVERTS CAN BE SALVAGED AND USED AGAIN SHOULD —

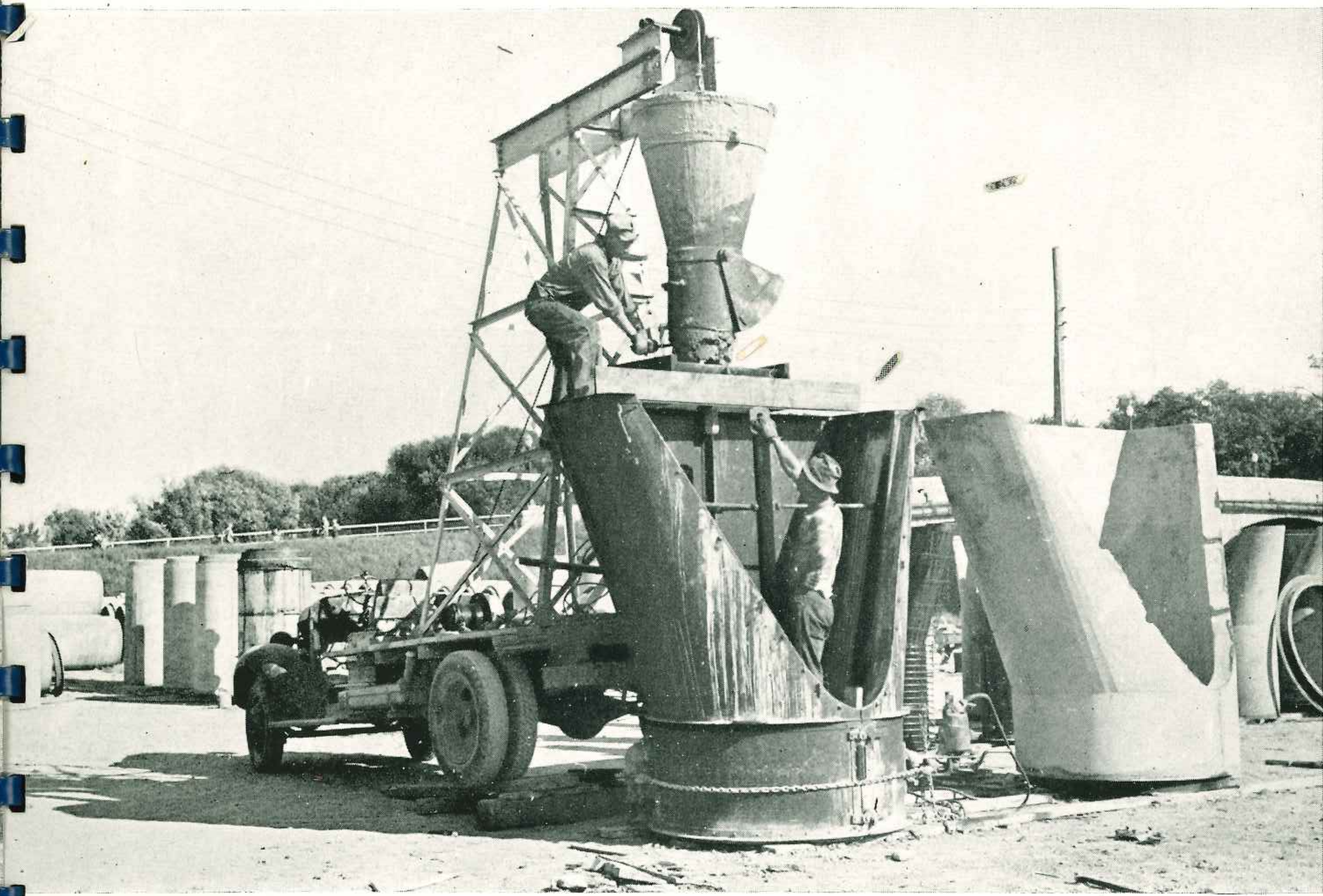
- Your culvert be later extended
- Your culvert be moved from one location to another
- Your culvert be taken out entirely because of change of drainage

COST

"CRETEX" END SECTIONS COST VERY LITTLE MORE THAN A CIRCULAR PIPE OF THE SAME SIZE; THEY ARE SO INEXPENSIVE THEY CAN BE USED ON ANY OF YOUR CULVERTS.

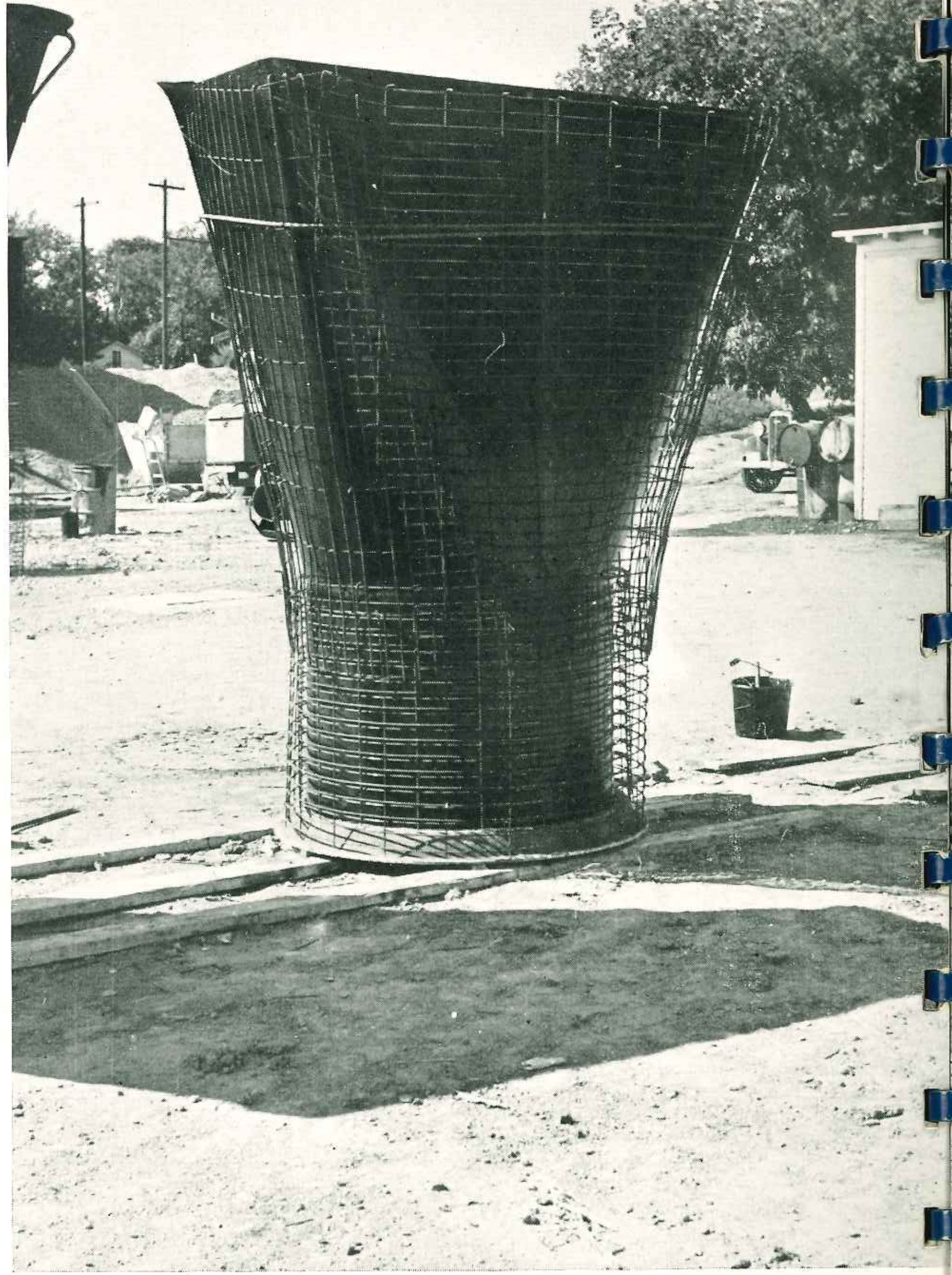


MANUFACTURING "CRETEX" END SECTIONS



MANUFACTURING "CRETEX" END SECTIONS

42 INCH
"CRETEX"
END SECTION



Showing steel reinforcing and the bottom side of the apron.

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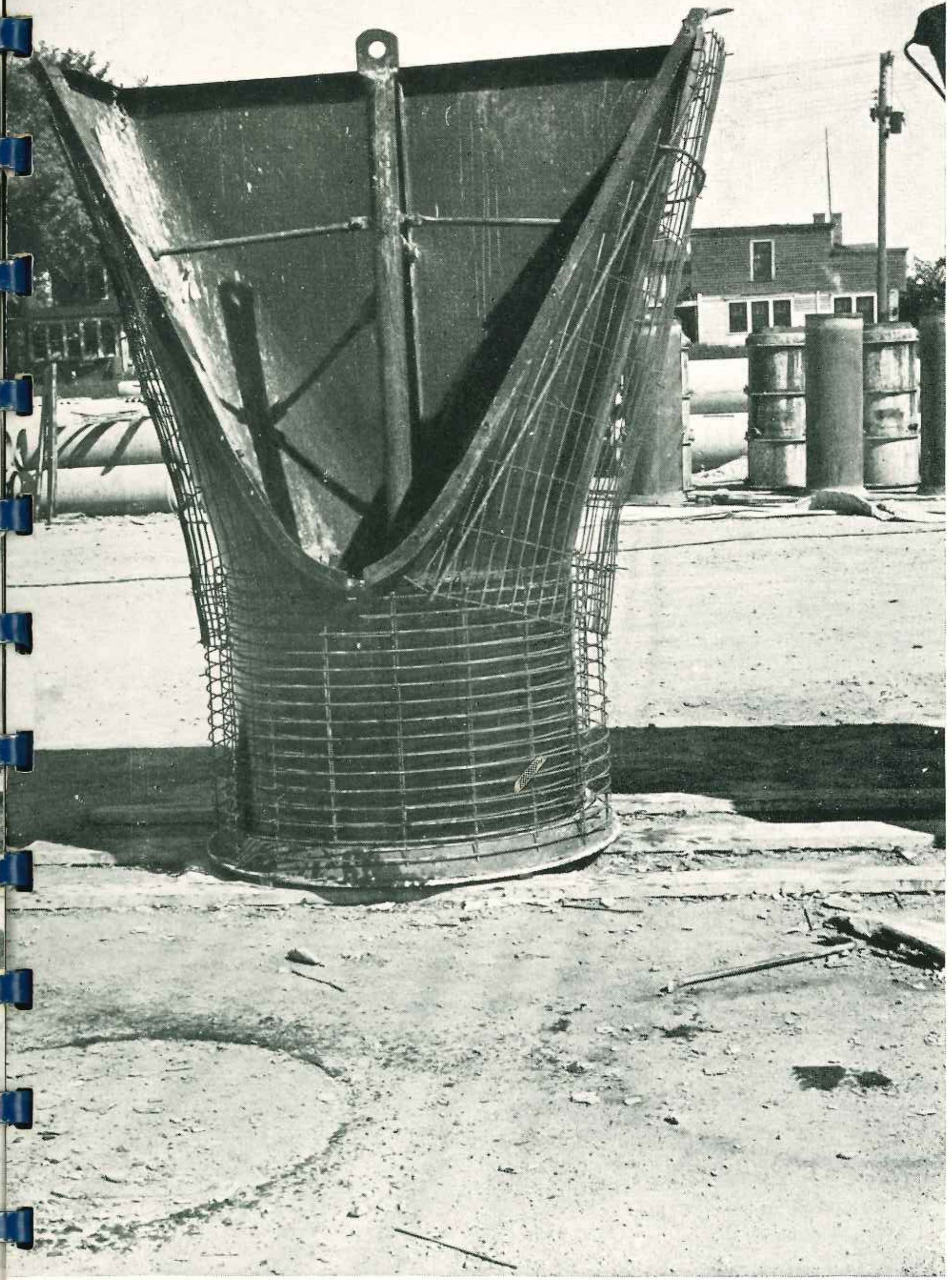
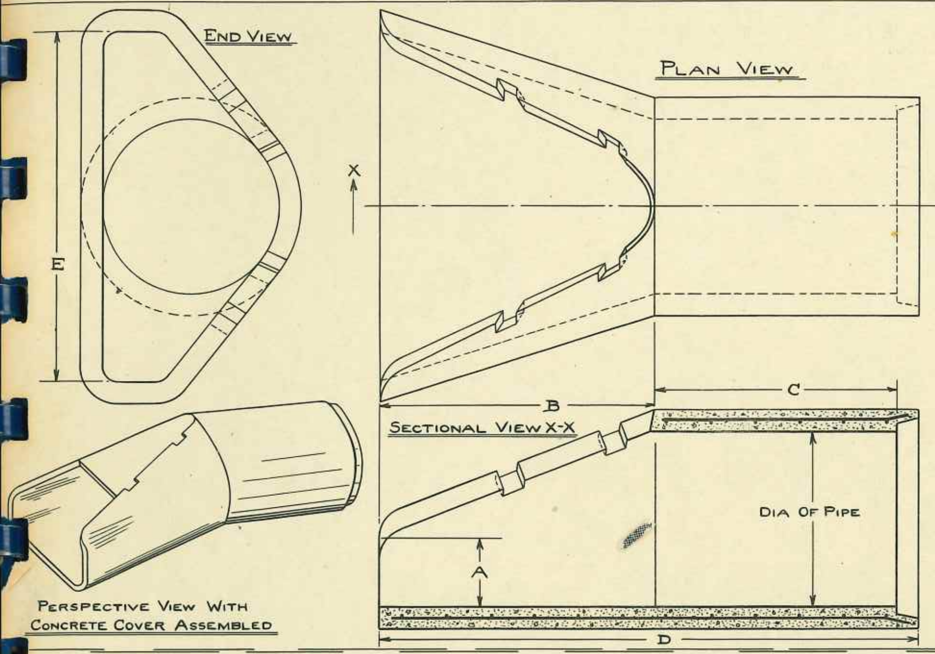
42 INCH
"CRETEX"
END SECTION



Showing steel reinforcing and the top side of the apron.



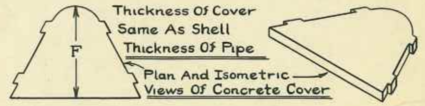
Dimensions Of Joint Same As State Highway Department Standard For Sectional Concrete Pipe Culverts.

Reinforcing Same As State Highway Department Standard For Sectional Concrete Pipe Culverts.

Dimensions Of Shell Thickness Same As State Highway Department Standard For Sectional Concrete Pipe Culverts.

TABLE OF DIMENSIONS

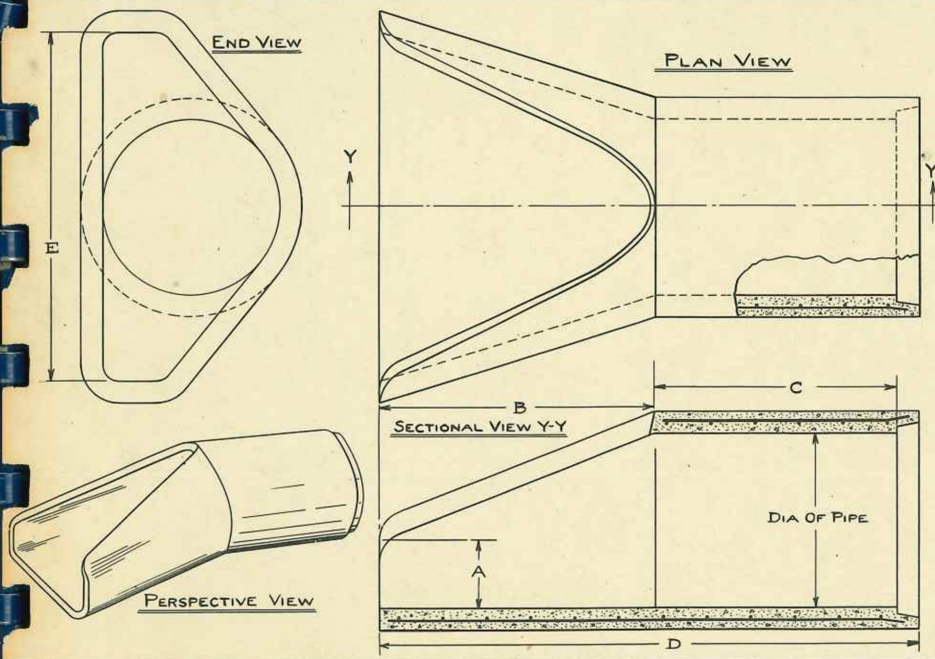
DIA OF PIPE	A	B	C	D	E	F
12 INCHES	4"	2'-0"	4'-0⅞	6'-0⅞	2'-0"	1'-3"
15 "	6"	2'-3"	3'-10"	6'-1"	2'-6"	1'-6"
18 "	9"	2'-3"	3'-0"	6'-1"	3'-0"	1'-6"
21 "	9"	3'-0"	[illegible]-1½"	6'-1½"	3'-6"	2'-0"
24 "	9½"	3'-7½"	2'-6"	6'-1½"	4'-0"	2'-5"
27 "	10½"	4'-1½"	2'-0"	6'-1½"	4'-6"	2'-8"
30 "	1'-0"	4'-6"	1'-7¾"	6'-1¾"	5'-0"	3'-0"
36 "	1'-3"	5'-3"	2'-10¾"	8'-1¾"	6'-0"	3'-6"
42 "	1'-9"	5'-3"	2'-11"	8'-2"	6'-6"	3'-6"
48 "	2'-0"	6'-0"	2'-2"	8'-2"	7'-0"	4'-0"

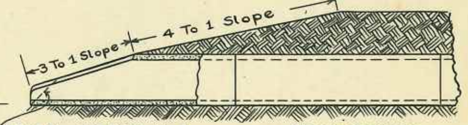


Thickness Of Cover Same As Shell Thickness Of Pipe

Plan And Isometric Views Of Concrete Cover

Flaring And Sloping End Section With Safety Cover.





1 To 1 Slope To Be Sodded Or Rip Raped If Culvert Is Not Laid In A Channel Of The Stream Bed.

Cross Section Showing Slope Of Embankment Over Culvert.

FLARING AND SLOPING END SECTIONS FOR CONCRETE PIPE CULVERTS.

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